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Papaya Ringspot Virus

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Papaya leaves with irregular areas of different shades of green (known as mosaic symptoms) are indicative of this virus disease. Other symptoms caused by Papaya Ringspot Virus (PRV) are: yellowing of young leaves, malformed leaves, dark green streaks on petioles and trunks, and circular green spots (some are ring-shaped) on fruit. PRV can be transmitted from diseased plants to healthy ones by aphids and mechanical means (eg. touching). The aphids that are reported to transmit PRV are: *Aphis craccivora, A. gossypii, A. illinoisensis, A. malvae, A. medicaginis, A. runicis, Acrytosiphum pisum, Carolinaia cyperi, Lipaphis erysimi, Macrosiphum solanifolii, Myzus euphorbiae, Neotoxoptera formosana, Pentalonia nigronervosa, Rhopalosiphum maidis, Rhodobium porosum, Sinomegoura citricola, Toxoptera aurantii, Uroleucon ambrosiae,* and *U. sonchi*. The most efficient of these aphids in transmitting PRV are *Aphis gossypii, A. runicis,* and *Myzus persicae*.

Plants that are infected with PRV do not develop normally. Their growth is slowed down and they can become stunted. The length of the petioles is shortened and, most importantly, the number of fruit set is reduced. The quality of fruit is also affected causing abnormal flavor and aroma.

PRV has been shown experimentally to infect various cucurbits, such as cucumber, melon, and watermelon. In nature, however, only papaya has been reported with PRV infection. A different strain of PRV (PRV-w) occurs on cucurbits.

Fruit on PRV infected tree with typical ringspots.

Control

It is very difficult to control PRV. The most effective ways that are known to date are (A) cross-protection and (B) transgenic resistance. With (A), a mild strain of the virus is used to infect the young papaya plants. This protects them from the more severe strains of the virus. With (B), a synthetic gene is introduced in papaya plants to make them resistant to PRV. These procedures are too complicated for use on a small scale and must be done by a government institution. If they are not available, several control measures are suggested:

- Before planting, eliminate wild papaya and cucurbits in and around your field.
- Aphids can transmit PRV from wild plants to healthy ones.
- Promptly eliminate any infected plants that may develop in the field.
- Control aphids within the field.
- Wash your hands and tools to prevent mechanical transmission of the virus.
- It is also best not to plant papaya and cucurbits next to each other.

For further information, consult an Extension Agent at your local land grant institution for current recommendations.

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